July 15, 1994

Attention: LT David Gebhardt, USN — Code HGWMC
Contracting Officer's Representative
Defense Information Systems Agency
DISA Information System Programs Organization
Arlington, VA 22204-2199

Subject: Software Users Manual for the Dynamic Analysis and Replanning Tool (DART), CDRL H00G

Reference: Contract No. DCA100-91-C-0123

Data Control #: 1234889-C-0107

Dear Lt Gebhardt:

Systems Research and Applications Corporation (SRA) hereby submits six (6) copies of the Software Users Manual for the Dynamic Analysis and Replanning Tool (DART), CDRL H00G, in accordance with the referenced contract.

Should you have any questions of a technical nature, please contact Robert Burciaga at (703) 803-1908. Contractual matters should be addressed to the undersigned at (703) 803-1733.

Sincerely,

M. Jean Price
Contracts Administrator

Enclosures: Six (6) copies of the "Software Users Manual for the Dynamic Analysis and Replanning Tool (DART)."

RECEIVED BY: _____ DATE: _____

DARTUM.H00G.01.889/15JUL94

JOPES DEVELOPMENT AND INTEGRATION (D&I)

DYNAMIC ANALYSIS

AND

REPLANNING TOOL (DART)

USERS MANUAL BUILD 3.4

CONTRACT NO. DCA100-91-C-0123

CDRL SEQUENCE NO. H00G

July 15, 1994

Prepared for:

Defense Information Systems Agency
Contract Management Division, PMR
Washington, DC 20305-2000

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ABSTRACT

The Dynamic Analysis and Replanning Tool (DART) is a deployment planning tool to support Course of Action selection and transportation feasibility estimates. DART allows planners and operators to design, edit, and manipulate Time-Phased Force and Deployment Data (TPFDDs). With DART, users can quickly analyze proposed Courses of Action in relationship to asset allocations and TPFDD modifications.

This manual is designed to assist with the development and execution of Operation Plans (OPLANs) and associated TPFDDs. This document supersedes all previous releases of the DART Users Manuals and incorporates all DART Build 3 enhancement and fixes through Build 3.4. This manual provides a system overview, describes hardware and software requirements, illustrates system navigation through functional applications, and provides instructions on how to use the DART system productively.

The eight user-requested enhancements have been incorporated in this DART Users Manual, as outlined below. Following each is the paragraph reference and page number for more information.

1. The ability to assign and reassign Unit Line Numbers (ULNs), Personnel Increment Numbers (PINs), and Cargo Increment Numbers (CINs) in DART. (Paragraph 4.5).

2. An automated "Split Shipment" capability. (Paragraph 4.6).

3. The ability to fragment "Frag and Insert" a requirement to reflect multiple sourcing. (Paragraph 4.7).

4. The ability to update the Time Phased Force and Deployment Data (TPFDD) from Type Unit Characteristics (TUCHA) file. (Paragraph 4.8).

5. The ability to view, edit, and create force module narratives. (Paragraph 4.9).

6. The ability to view and edit level four cargo detail. (Paragraph 4.12.5).

7. Access to the Status of Resources and Training (Unit Information) File for "Smart Sourcing." (Paragraph 4.15.3).

8. The ability to create TPFDD Records from scratch. (Paragraph 4.3.4).

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SECTION 1 — INTRODUCTION

1.1 PURPOSE AND SCOPE OF DART USERS MANUAL

This document should be used in conjunction with the Global Command and Control System (GCCS) user and system administration documentation. DART is one of several applications integrated into this client/server environment. Although DART can be operated in the stand-alone mode, its full potential is realized when used in conjunction with other applications such as the Joint Flow and Analysis System for Transportation (JFAST), the Information Management Subsystem (IMS), and Reference File Manager (RFM).

Although DART offers transportation simulation models, JFAST has evolved into the "standard" transportation simulation tool for rapid force closure analysis. IMS provides the necessary tools to transfer Time-Phased Force and Deployment Data (TPFDD) between these applications. When the GCCS client/server environment is connected to the Worldwide Military Command and Control System (WWMCCS) or other connections are made through wide area networks (WAN), GCCS tools will provide the means to populate DART with TPFDDs and reference files from external sources.

DART is part of the GCCS Block 1 fielding platform. Applicable procedures, at the time of this printing, are provided where appropriate. However, the GCCS environment is rapidly maturing and although the internal workings of DART as described in the manual will remain essentially unchanged, the surrounding environment is under constant improvement and revision. To use DART most effectively, users should supplement this manual with documentation such as the "Revised TIP End Users Manual", January 6, 1994 provided in conjunction with GCCS fielding at your site to keep abreast of the latest developments.

As an aide to the user, an appendix of useful data codes and data-related definitions is provided. This appendix is a compilation of general TPFDD related information, data codes and concepts associated with DART operations. Known problems with codes and data inconsistencies are mentioned.

1.2 ORGANIZATION OF DART USERS MANUAL

This DART Users Manual is divided into nine parts and several appendices:

Section 1 - Introduction

Section 2 - DART Overview

Section 3 - DART Basics

Section 4 - TPFDD Editor

Section 5 - Situation

Section 6 - Transportation Models

Section 7 - Graphs

Section 8 - Reports

Section 9 - Utilities

Section 10 - File Transfers

Appendix A - Abbreviations

Appendix B - Data Codes

Appendix C - Source Documents

Appendix D - Index

1.3 RELATIONSHIP OF THIS MANUAL TO PREVIOUS VERSIONS

This manual replaces the DART Users Manual Build 3.2 dated 8 May 1992. The first five sections of this manual and the appendixes have been completely changed and updated from the previous version. However, sections six through ten dealing with transportation models, reports and utilities remain unchanged from the earlier version. Primary emphasis was placed on clarifying the use of the TPFDD Editor portion of DART to include the eight user-requested enhancements incorporated in Build 3.4. A primary objective was to improve "user-friendliness" and develop a more "navigation" oriented manual.

SECTION 2 — DART OVERVIEW

2.1 BASIC DESCRIPTION AND FUNCTIONALITY

DART is a computer-based operation planning and analysis system, initially developed by ARPA and USTRANSCOM, and now being fielded under the Technology Insertion Project (TIP) phase of the Global Command & Control System (GCCS).

DART provides an integrated set of automated tools and a database supporting joint operators and planners engaged in deliberate and contingency planning. DART provides users with the ability to rapidly create, edit, and analyze TPFDD files.

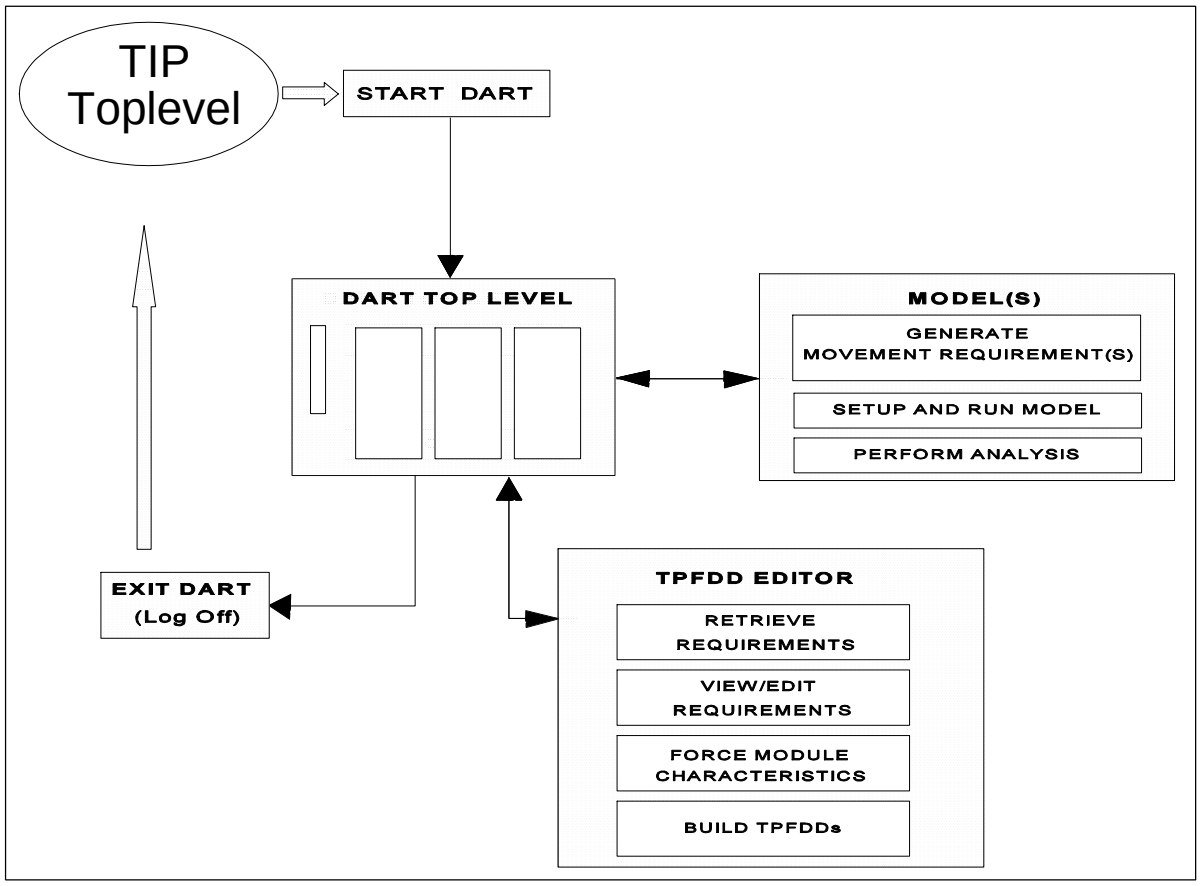


Figure 2-1: DART Functions

The DART system supports these basic processes:

- Plan Processing and TPFDD Editing

- Plan Analysis, using available transportation analysis models (currently RAPIDSIM and PFE)

- External Integration, including TPFDD Upload/Download (much of which will be performed by TIP functions).

DART allows force, deployment, and transportation planners to directly analyze, create, and manipulate TPFDDs quickly, easily, accurately, and graphically.

DART supports Course of Action (COA) selection and transportation feasibility estimates. Through the use of DART, battle staffs can speculate on potential operating capabilities and select a COA that fully supports the situation. DART also affords opportunities to quickly analyze proposed COA in relationship to asset allocations and TPFDD modifications. DART's capability to graphically display, for rapid editing, downloaded TPFDDs is useful to both planners and operators in joint operations during deliberate and time sensitive situations.

DART uses TPFDDs created and distributed through JOPES, and has the capability to upload completed results back into JOPES. At all sites, DART requires some form of automated or manual interface with local WWMCCS/JOPES systems.

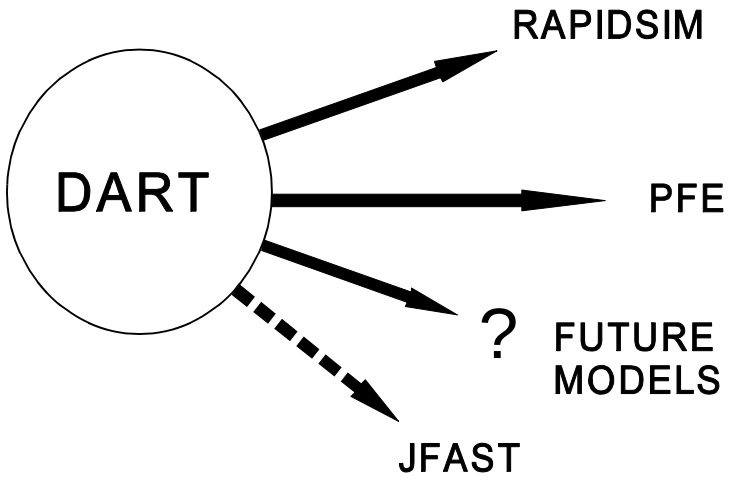


Figure 3-1: DART Models

To perform its analysis, DART takes advantage of analytical tools developed by other projects. DART currently includes direct interfaces with the Rapid Intertheater Deployment Simulator (RAPIDSIM) and the Prototype Feasibility Estimator (PFE) model. DART can also output files specifically designed for the Joint Flow and Analysis System for Transportation

(JFAST). Additionally, DART has the ability to link easily to other site-unique analysis tools, where this may be desired.

2.2 SYSTEM HARDWARE AND SOFTWARE

DART operates on *Sun* SPARC hardware, either in a single or multiple workstation configuration. DART uses *SunOS*, Oracle Database Management System (DBMS), and applications written in LISP, C, and FORTRAN.

SECTION 3 — DART BASICS

3.1 NAVIGATION

DART operates entirely in a window environment, with menus, icons, and other mouse-controlled symbols. Users must know how to use the mouse to control windows.

3.1.1 Mouse Operations

DART screens and menus contain a wide variety of mouse sensitive options which must be selected or activated with the mouse.

Some selections require a simple **single click** of a mouse button while the mouse pointer (cursor) is positioned over a menu selection, button, icon, or other option. Other selections require the mouse button to be pressed and held down in order to select an option from a **pull-down menu**. Many data entries are changed by first clicking the mouse button on the desired data field.

Clicks that are made at the wrong time, too soon, or on unacceptable choices, will usually generate a beep. Should that happen, either try again more slowly, or determine what else is wrong. Avoid **double-clicking** any mouse buttons. Stray clicks may be stored and cause unpredictable and undesired results.

In DART, most menu selections are made by clicking the left mouse button on the desired option or entry. Mouse operation varies somewhat between the Summary Analysis (top level) portion of DART, and the TPFDD Editor:

In Summary Analysis

The right mouse button will activate a pop-up of options, if one exists, for the current mode or highlighted object.

The left button will usually activate one of the menu options, as a pre-established default.

To cancel/exit/abort a menu choice, there is usually a CANCEL button.

In the TPFDD Editor

Selections are made through the left button.

To abort a pop-up menu without making a selection, either click the left button on a CANCEL button, if there is one; or else click the middle mouse button while the cursor is NOT positioned over any valid selection.

Most DART windows provide a **mouse information box**, which displays the available options for the mouse buttons; or the potential results of the selection on which the mouse pointer happens to be positioned.

Particularly when first learning DART, pay close attention to the shape of the mouse pointer; these shapes will help distinguish between different system actions.

If the system is unresponsive to mouse clicks for a prolonged period of time, see your DART Site System Administrator.

3.1.2 Window Management

DART operates on workstations that support X-Windows functionality. X-Windows supports multiple task processing, using multiple windows on the screen. This requires the user to manage the windows, and to maintain some awareness of what is happening in the windows.

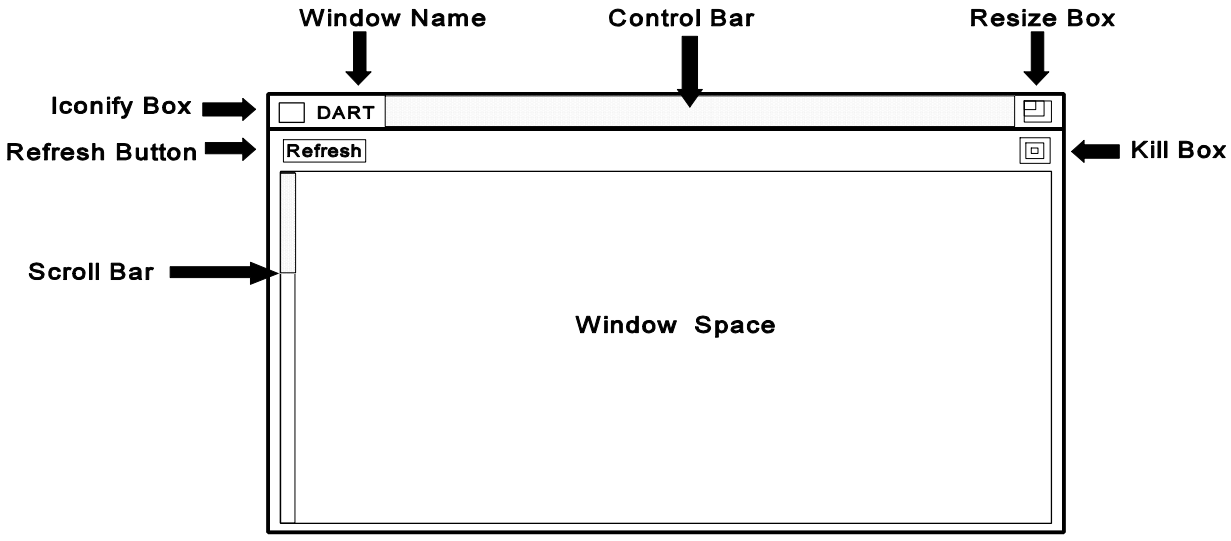


Figure 3-1: Standard Window Features

Windows may be created (opened) and eliminated (closed, or killed); they may be moved around on the screen; their size may be changed; they may be reduced to a miniature size (iconified) and then expanded back; and when multiple windows are displayed together, they may be overlaid (as foreground or background).

A key point with windows is that each window provides independent access to the workstation processor; several windows may be open, and have jobs running, simultaneously. As long as a window is active (whether full sized or as an icon), its operations (if any) will continue. Only when a window is killed (completely eliminated) will its operation completely cease.

WINDOW FEATURES

DART windows follow the X11 window standard. The actual user interface (the "look and feel") depends on the window manager that is provided on the specific DART workstation. DART most commonly is provided with the generic X11 window manager (twm), whose features are shown in figure 3-1. Because DART may run on various workstations, other windows systems (such as Motif, with mwm, or OpenLook, with olwm) may be encountered. These all provide the same variety of features, but the shapes, colors, and orientations may vary.

WINDOW INPUT

To access a window for keyboard input, the mouse cursor must be positioned within the desired window.

WINDOW ICONS

To **iconify a window** means to transform a window into a small icon on the screen, which can be used to reopen the window at a later time. Any operation in effect, in a window, continues unchanged when that window is iconified or opened.

Idle windows (windows which are not being used) should be iconified to avoid covering other windows. When a DART window is iconified, it is reduced to a small rectangular grid (called an icon) with the window title displayed.

- To **iconify** a window, point to the square in the top left-hand corner of the window and click the left mouse button.
- To **move** this icon, depress the left mouse button and drag to a desired position.
- To **reopen** this window, click the left mouse button on this icon.

Iconifying and opening windows has no effect upon program execution.

MOVE A WINDOW

The usual and easiest way to move a window is by using the window control bar along the top of the window. Place the mouse pointer on this bar and, holding down the left mouse button, drag the window to the desired location then release the button.

Some windows that do not have control bars may be moved, using the mouse, and pressing the command key on the keyboard (marked with a diamond).

One of the options available from the Background Screen utility menus is move. This option will move any window, whether or not it has a window control bar. (Use the Window Operations Utility Menu, available by clicking the left mouse button on the background screen.)

RESIZE A WINDOW

To change the size of a DART window, place the mouse pointer on the small resizing square in the upper right corner of the window. Ensure you do not use the kill button. The mouse cursor should change to a **pointing hand**.

Now, press and hold down the left mouse button. The hand should change to a cross-shaped cursor, and a grid will form across the window.

Carefully move the mouse cursor across (inside) the window to touch one side of the window frame; this side can then be pulled in or out to the size desired. When the window outline reaches the desired size, release the mouse button.

Also, a resize option is available on one of the Background Screen utility menus.

CAUTION: Never resize (or move) a window before the image inside that window is completely drawn.

SCROLL A WINDOW

Most windows have a scroll bar along the left hand side. The bar may not become obvious until the text or other material in the window exceeds the available window space.

When more data is available than can be viewed, a short grey-shaded bar appears along the scroll bar. The size of that bar, compared to the entire length of the scroll bar, indicates roughly the proportion of the data being viewed at that moment. The scroll bar moves as the data viewing location changes in the data file. (As the data scrolls up, the bar moves down.)

The scroll bar can be controlled through the mouse buttons:

Left Button Placed anywhere along the scroll bar and clicked, this button causes the data to scroll up, and the scroll bar to move down, accordingly.

Middle Button When this button is held down on the top edge of the shaded bar, that bar may be moved in any direction. (Note the change in style of the cursor to a double-arrow.)

Right Button Placed anywhere along the scroll bar and clicked, this button causes the data to scroll down, and the scroll bar to move up, accordingly.

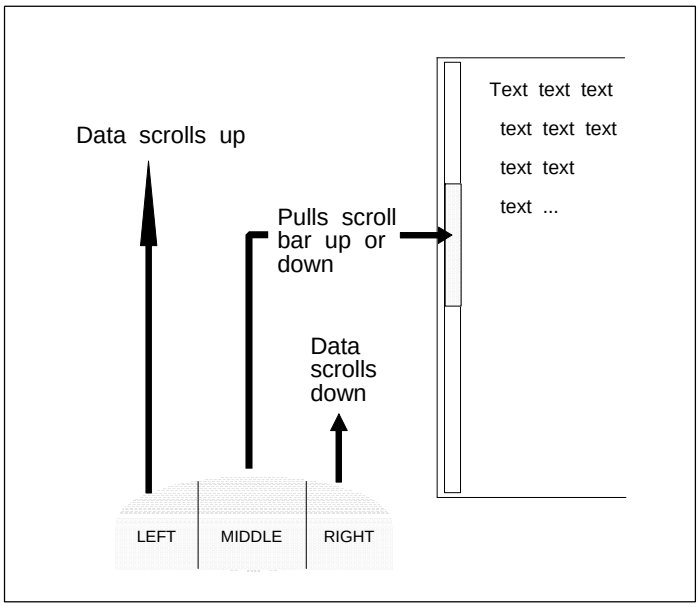


Figure 4-1: Scrolling by Mouse

SKELETON WINDOWS

DART software sometimes spawns skeleton windows, which are blank rectangular grids that must be positioned by the user prior to their use for data display. When a skeleton window appears, drag the window to the desired location and click the left mouse button.

CHANGE WINDOW STATUS

Click the appropriate mouse button on the control bar along the top of the desired window to produce the following effect:

Left Button Change the status of an open window from background to foreground, meaning that the selected window displays on top of any other window

Middle Button Toggle the status of an open window from background to foreground, or from foreground to background

EXIT FROM A WINDOW

To **exit**, **close**, or **kill** a window means to terminate a window, end its operation, and completely stop any process which is active from within that window. Normally, a window would not be closed until its operations had ceased. Killing its window is, however, one way to stop an operation.

To exit from a DART window, the user has at least one of the following choices, depending on the type of window:

- A window may contain a menu which includes the option to **Quit** or **Exit**. Select that option.

- Some windows have a **Kill Box** in the upper right corner of the screen, below the control bar (and below the resizing button). Click the left mouse button on this icon to exit (kill) the window.

- If the window contains a **Prompt** for keyboard input, typing in **exit** or **(quit)** and pressing **< RETURN >** may close the window.

- The Window Operations Utility Menu, available by clicking the left mouse button on the Background Screen, includes a Kill option. After selecting this option, position the cursor over the desired window. Clicking will close that window. Use this option with care, since it will terminate any operation connected with the selected window, and cannot be cancelled.

Some special window types may require a special exit process; the following are examples that may be found in DART:

Access SQL Window

At the **SQL >** prompt, type **exit**.

Xterm Window

At the **%** prompt, type **exit**. If the prompt is **#** (meaning super-user), type **exit** twice, to quit from both levels.

Map and Graph Windows

Use the **Kill Box** to quit.

Retrieved Graphic Window

Place the mouse in the middle of the window and type **q**.

If all else fails, use the **window kill** option, available by clicking the left mouse button on the background screen, and selecting **window kill** under window operations. (See further under the Utilities section.)

3.1.3 Main Screen

Once the user has initiated (activated) DART, the DART Main Screen will be displayed.

The DART Main Screen is an X-Window, and has all of the typical window features. In addition, it has several DART specific areas, which are described below.

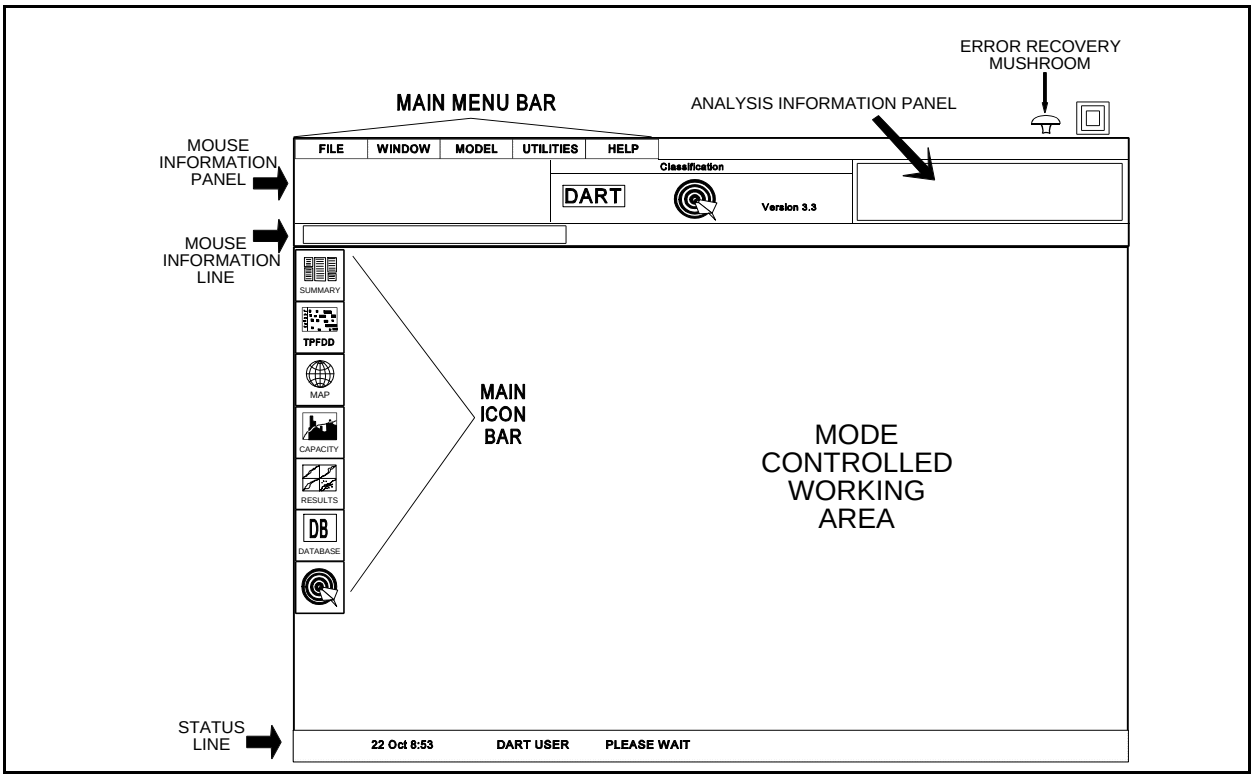


Figure 5-1: DART Top Level Screen

3.1.4 Main Menu Bar and Buttons

The Main Menu Bar consists of a set of buttons, along the top line of the screen, which are always present (on this screen) regardless of the current DART mode of operation. They activate pop-up menus which allow the user to perform actions that can be useful in all modes.

Additional buttons will appear, on the right side of the menu bar, when the user changes modes by selecting one of the icons from the Main Icon Bar.

The five initial buttons on the Main Menu Bar are described in the following paragraphs. Others will be described in their appropriate sections.

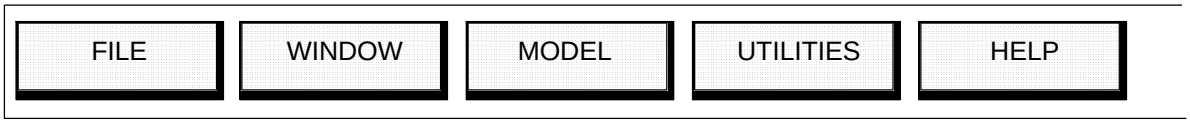


Figure 6-1: Main Menu Bar

FILE BUTTON

The Main Menu File button allows the user to open, close, import, export, and delete various types of files. Selection of this button activates a pop-up menu containing many further options.

These are summarized here:

TPFDD Options

The TPFDD options allow the user to select a TPFDD for analysis, import a TPFDD into the DART database from a tape or file, or export a TPFDD from the DART database to either JOPES or Flow and Analysis System for Transportation (FAST) format.

Analysis Options

The Analysis options allow the user to open, create, save, close, or delete an existing analysis file.

Situation Options

The Situation options allow the user to open, create, save, close, or delete an existing situation.

RAPIDSIM Results

The RAPIDSIM Results options allow the user to import and delete the files which contain results of a previous RAPIDSIM model run. The results files contain only results, no TPFDD or Situation information is available from the import option, and therefore information from a model run cannot be restored unless the user has a copy of the situation and TPFDD and a record of changes to that situation and a record of the date and time the run was performed.

Exit DART Option

The Exit option is used to permanently end a DART session.

To exit DART:

A window will appear requesting confirmation of the exit, and asking whether the analysis files that have not been previously saved should be saved.

Select **OK** to exit, **Cancel** to remain in DART.

CAUTION: The system will inform the user of any open analysis files which have not been saved, and allow the user to assign names and save these files; but it will **NOT** inform the user of situation files which have not been saved.

In a stand-alone mode, this will end the current session of DART, and leave the user facing the background screen, still logged in. At this point it is possible for anyone at the keyboard to restart DART without having any password knowledge. In TIP/JOPES Executive Subsystem (JES), the user will be returned to the JES screen.

WINDOW BUTTON

DART allows the user to open more than one analysis file (a combined set of TPFDD and situation files, and model run results). DART layers the analysis files, and calls these layers **windows**.

The window button is used to change the current Analysis File displayed in the Analysis Window (meaning on the three Summary Panels).

CAUTION: This function has no connection with the various UNIX system X-Windows operations.

MODEL BUTTON

DART allows the user to select the type of transportation analysis model desired. This button activates a pop-up menu of models for the user to choose from.

At present the only available choices are RAPIDSIM, PFE, and none. This selection can also be performed through the Analysis Information Panel.

UTILITIES BUTTON

DART provides a variety of system utilities that are available through the UTILITIES button on the main menu bar. A pop-up containing several options appears; see the section on DART Utilities for their use. Other utility functions and operations may be available in the DART system.

HELP BUTTON

This option activates the on-line system help function of DART. This option allows the user to select *Display Users Manual* which will activate a window containing the text of the DART Users Manual (Build 3.2, 15 October 1992 Version at the time of this printing). The user can search on key words to find specific topic areas.

3.1.5 Main Icon Bar and Icons

The Main Icon Bar consists of a set of icons along the left side of the screen.

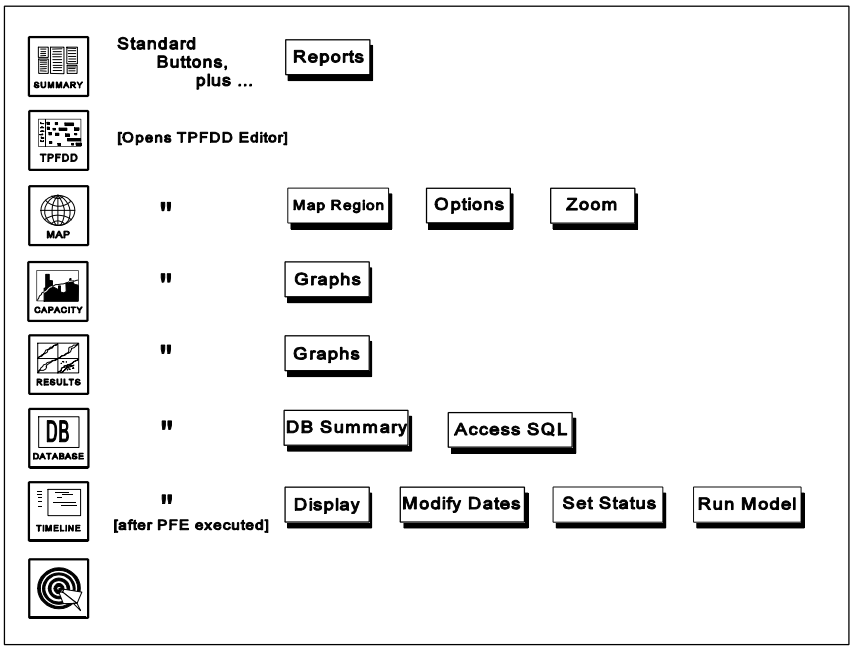


Figure 7-1: Main Icon Bar with Added Menu Buttons

These icons allow the user to select, or change, the current mode of operation, which will change the current view of the central portion of the screen, and may also add further buttons to the Main Menu bar. The following icons are in the DART Main Icon Bar:

SUMMARY ICON

When selected, this icon produces a three panel display of summary information concerning the currently selected files.

The *Left Panel* on the screen contains TPFDD summary information. This panel appears after a TPFDD is selected. The Update button available in this section of the screen will update the summary TPFDD information. Once this update option is selected, the model results become invalid.

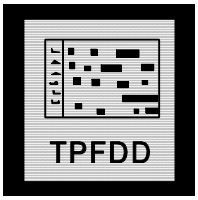
The *Center Panel* on the screen contains Situation summary information. This panel appears after a situation is selected (or created). The Edit buttons available in these sections of the screen will allow modifications on asset and node information contained in the situation file. Once the situation has been edited, the model results become invalid.

The *Right Panel* on the screen contains model run summary information. This panel appears after a model type is selected. The buttons available in these sections of the screen will allow the preparation and the running of the model. This panel can be populated by data from a previous model run or by actually selecting a TPFDD, a situation and a model, and running the model.

CAUTION: The panels will display **ONLY** as appropriate files are selected. If no TPFDD, Situation, or Model is selected, **NOTHING** will show.

The Reports Button is added to the Main Menu bar whenever Summary is selected.

TPFDD ICON

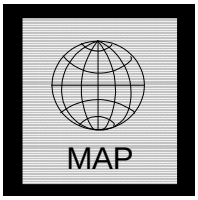


When selected, this icon will activate (start) the TPFDD Editor, and the TPFDD Editor window will appear.

CAUTION: When the TPFDD Editor is activated, a TPFDD must be selected before any TPFDD editing options are operational, even if one has already been selected at the main TPFDD Summary Panel.

A **TPEdit Background Window** momentarily appears when this icon is selected, and is then overlayed by the TPFDD Editor window. The Background window is needed only when a system error occurs while the TPFDD Editor is functioning. If this window is in the way at some later time (for example, if the TPFDD Editor window is iconified), the background window may also be iconified and moved to a convenient location.

MAP ICON



When selected, a situation (main) map is displayed in the central area of the main screen, and the following buttons are added to the Main Menu bar: Map Region, Options, Zoom.

If the local DART system has been set to display a default map region, that region will automatically appear in the window. Otherwise, nothing may be displayed until some region is selected from the pop-up activated by the **Map Region** button.

CAUTION: This situation map (or main map) is completely different from the TPFDD Editor map.

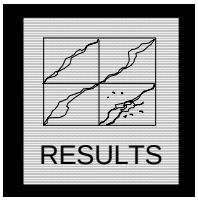
CAPACITY ICON

This option allows the user to view Capacity Graphs in the central area of the main screen.

The following button is added to the menu bar: Graphs.

A pop-up of graphs available in this mode is activated by clicking on the Graphs button.

RESULTS ICON



When selected, this icon allows the user to view graphs, based on the data from the selected model run, in the central area of the main screen.

The following button is added to the menu bar: Graphs.

A pop-up of graphs available in this mode is activated by clicking on the GRAPHS button. Results of the current analysis or model run can be displayed using the various graphs available on this pop-up.

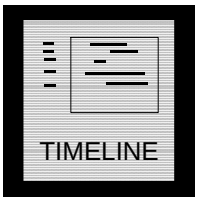
DATABASE ICON

This mode supplies two functions for the advanced DART user or system administrator. The following buttons will be added to the menu bar:

DB Summary Selecting this button will generate a summary report on the database. This will allow the System Administrator to perform periodic problem checks of the database. This is a lengthy and complicated process and is intended only as a tool for the System Administrator, not the average DART user.

Access SQL Selecting this button will provide a SQL window. This option allows the advanced DART user to directly query the DART database using Oracle SQL-Plus commands. Users should not use this option unless they are knowledgeable of SQL.

TIMELINE ICON



The selection of this icon activates a timeline display of the currently selected TPFDD.

This icon does not appear unless the PFE model type has been selected, and **Generate Requirements** has been performed.

After PFE has been selected, but before that model has been run, the Timeline display will show only the original TPFDD Editor movement requirements, organized by Force module.

After PFE is run, the Timeline Display will include closure date information for all movement requirements.

CAUTION: The selected TPFDD must have at least one FM, otherwise no icon will be displayed. It is strongly recommended that any TPFDD being analyzed with PFE and the timeline display include a default FM that incorporates all movement requirements.

DART ICON

This option leaves the current DART mode and repaints the DART logo in the central portion of the screen. This will restore the main menu bar back to the generic functions.

3.1.6 Mouse Information Panel

The Mouse Information Panel is on the left side of the screen, directly below the menu bar. This panel is used to give the user information on whatever option (icon, menu button, etc.) is currently highlighted by the mouse.

3.1.7 Mouse Information Line

The Mouse Information Line, directly below the Mouse Information Panel, constantly gives the user prompts on which operations the various mouse buttons will produce, based upon the option currently highlighted.

3.1.8 DART Mini Logo

The DART Mini Logo is to the right of the mouse information panel. Clicking on the logo has the same effect as clicking on the DART icon.

To the right of the mini logo is the DART version. When the mouse is clicked on the version, a small window appears showing the release date and time. This information should be used whenever reporting problems or incidents.

3.1.9 Analysis Information Panel

The Analysis Information Panel, in the upper right portion of the screen, displays the file names of the selected Analysis, TPFDD, and Situation (if any), and the selected model type.

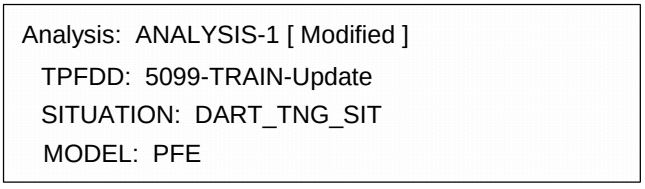


Figure 8-1: Analysis Information Panel

The Analysis, TPFDD, Situation, and Model prompts are mouse sensitive. The user can actually make the corresponding selections using these prompts.

If **[MODIFIED]** appears next to the analysis file name, this analysis, as it currently resides in memory, has not been saved.

3.1.10 Mode Controlled Portion of the Screen

The Mode Controlled Portion of the Screen is the central area where the large DART logo is located when a session is initiated. This is the main working area of the display. The icons on the main icon bar control this portion of the screen.

3.1.11 Status Line

The Status Line, along the bottom of the screen, displays status information about the state of DART system operations.

3.1.12 Error Recovery Mushroom

The Error Recovery Mushroom is in the upper right corner of the DART main screen, above the Analysis Information Panel. If a system error occurs, click the left mouse button on the mushroom. This should recover the current DART session.

3.1.13 Classification Line

Along the top line of the main screen will be displayed the security classification marking appropriate to the selected TPFDD.

The TPFDD Editor screen also will show a Security Classification entry, top and bottom, once a TPFDD has been selected. TPFDD classifications may be modified through the **TPFDD Details** option of the TPFDD Editor Operations Pop-up menu.

3.2 BASIC DART OPERATIONS

This section describes the various ways to login and logout, exit, and quit various DART and system functions and levels.

3.2.1 System Organization

While the original DART installations were predominantly on stand-alone workstations, most current installations use a network-based client/server architecture. The user is seated at a workstation (client) running some form of X-Windows and windows-based application interface, and the DART application and DART database are running on a server some distance away.

The workstation and server system levels may be viewed as:

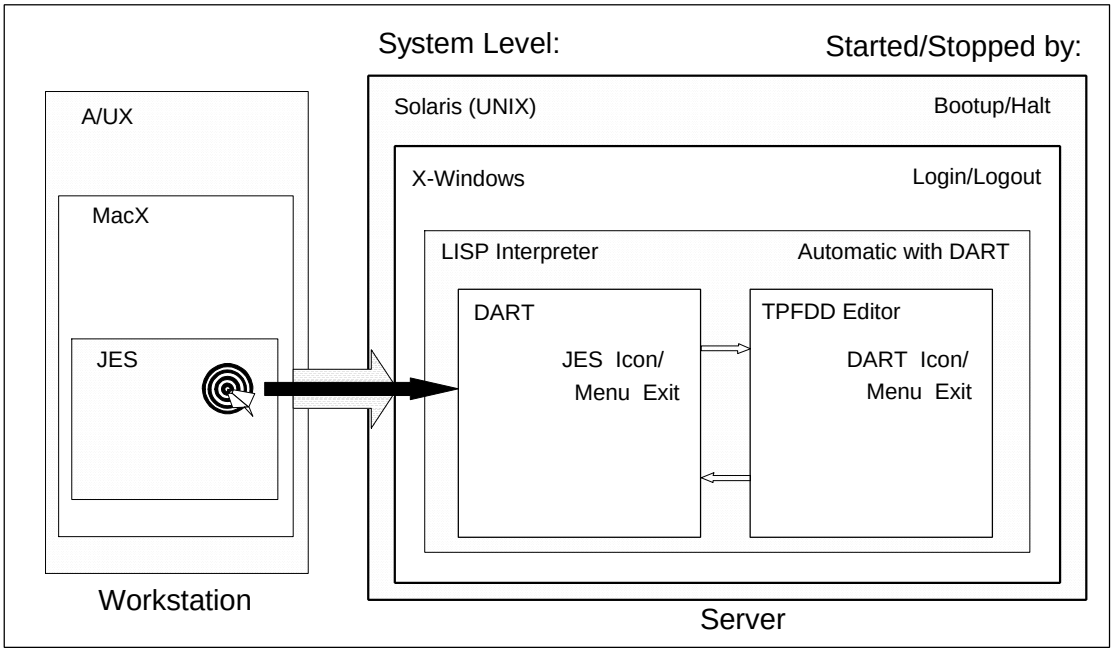


Figure 9-1: System Levels

WORKSTATION

A/UX Most workstations run some form of UNIX, although this is not strictly necessary.

MacX Some form of X-Windows software is necessary. The WWMCCS Information System (WIS) Workstation (WWS) runs MacX.

JES Under the TIP/GCCS program, a top-level menu called JES is used to access DART and other applications.

SERVER

Solaris (UNIX) The basic operating system, a UNIX system variant; controls the user login process; always active unless the system is halted.

X-Windows X11R5 Manages the Xterm, DART, and any other windows; permits multiple applications to run simultaneously; active whenever the user is logged in.

LISP DART programming environment; usually hidden from the user view, but may appear during a DART system error; started automatically whenever DART is activated.

DART The primary application; appears as the top level DART screen; can be activated and exited by the user; started from icon on JES screen.

TPFDD Editor One of the DART applications, but operates as a separate function and window; selected from the DART Main Menu TPFDD icon.

Note: There is also a database management system, **Oracle**, which is running the DART database; and a system level management function called **CRONUS**, which manages operations between other functional areas and the Oracle database processes; both of these start automatically upon workstation or server bootup.

3.2.2 Login and Exit

Using a function within the DART system really involves logging in to, starting, or activating series of levels of computer activity, both workstation and server. These levels should be entered and exited from properly, in the right order, to avoid creating system administrative problems and possibly security problems.

STARTING DART

In the GCCS environment DART is launched from the JOPES Executive Session (JES) screen by **single clicking** the DART icon. If this is the first application launched through JES for this session a logon screen will appear requesting your userid and password. Once entered, a pop-up stating "Launching DART" will appear followed by the DART top level screen. For specific information about using JES, refer to the "Revised TIP End User Manual", January 6, 1994.

Using a Sun workstation, to initiate a DART session, from the top (Solaris) level of the system:

1. Login to the workstation with the appropriate User ID and Password. A background screen will appear, followed by a small console window, and usually an Xterm window. (The console window permits monitoring of system status; the Xterm window is provided for the convenience of expert users.)

2. For most DART users, the system will proceed to start loading LISP and the DART application; a DART background screen will appear momentarily, followed by the DART Main screen.

3. If DART does NOT complete loading, and the process stops with the background screen (and console window), continue with the following steps.

To start DART from the Background Screen (which means that someone has already logged in):

1. Depress the middle mouse button on the background and select DART from the subsequent menu.

2. The DART Main Screen will soon appear.

START THE TPFDD EDITOR

Select the **TPFDD Icon** from the DART Main Icon Bar. The TPFDD Editor function will start, and the Chart Display screen (with no data) will be displayed.

EXIT FROM THE TPFDD EDITOR

If the user needs to leave the TPFDD Editor for a short while, but intends to return to it soon, the TPFDD Editor window may be iconified. Otherwise, the TPFDD Editor may be closed using the following steps.

1. Select EXIT from the TPFDD Operations Popup menu. The current TPFDD will be deselected (with any changes saved), the system will return to the DART Main Menu, and that session of TPFDD editing will be terminated.

2. A query may appear concerning closing the DART database. Normally, select NO.

If working in one of the higher level DART modes, while the TPFDD Editor is still open (but iconified), it is not necessary to return to the TPFDD Editor to close it before exiting from DART.

EXIT FROM DART

The DART top level screen may also be iconified, temporarily, if other DART functions are being used.

To **permanently** end a DART session (from the DART Top Level Main Screen):

CAUTION: The system will inform the user of any open ANALYSIS files which have not been saved, and allow the user to assign names and save these files; BUT it will not inform the user of SITUATION files which have not been saved.

1. Make sure you save your situation and/or analysis files if desired.

2. Select **Exit DART** from the menu of the FILE button on the DART Main menu bar.

3. A window will appear requesting confirmation of the exit, and asking if the analysis files that have not been previously saved should be saved.

4. Select **OK** to exit, or **CANCEL** to remain in DART if you change your mind at the last moment.

This will end the current session of DART, and leave the user facing the background screen, still logged in. At this point it is possible for anyone at the keyboard to restart DART without having any password knowledge.

COMPLETELY EXIT FROM THE SYSTEM

If DART was launched outside of the GCCS environment, a full system exit should be performed (for security reasons) whenever the DART system will be left unattended.

While this exit may be performed from within DART, while DART is still running, it should NOT be. The user should perform an orderly exit from DART prior to using the system exit process.

To completely exit from the operating system, while at the background screen:

1. Point at the background screen.

2. Hold down the left mouse button.

3. From the pulldown menu, scroll down to TWM OPERATIONS and carefully move the mouse to the right side of the selection. (If not moved carefully, the lower menu for Window Operations will appear instead.)

4. From the subsequent pulldown menu, select **EXIT**. This will exit and logout completely from the system. A user login and password will then be required to access DART.

EMERGENCY EXIT

When all else fails, and none of the routine methods for closing or ending an operation or a window are successful, one of the following actions may work depending on your particular DART environment or workstation.

- Close a window and its process using the **Window Kill** menu pick (from the Background screen, left mouse button, utility pop-up menu).

- Use an Xterm window to view active UNIX processes (using command **ps**), and then **kill** the main DART process; if the system has locked up completely, access it through another workstation of the network, and kill the process from there.

- Kill the whole workstation system using the TWM exit menu pick (from the Background Screen left mouse button utility pop-up menu).

3.2.3 Status Indicators

A variety of status indicators are provided for DART.

MAIN SCREEN STATUS LINE

The Status Line, on the bottom of the DART Main Screen, displays the following status information (from left to right):

- *System Date/Time*

- *User ID (Name)*

- *Current System Status* (Ready, Please Wait, GC (garbage collection, meaning memory management), etc)

- *Processing Status* (Loading TPFDD, Generating Movement Rqmts, etc).

TPFDD EDITOR STATUS SYMBOLS

The following system status symbology applies while in the TPFDD Editor:

Database Activity Square: A blinking yellow "**D**" in the left of the status line (bottom of screen) means the system is busy and will not accept input.

If the message **READY** is in the middle of the status window (bottom of screen) the system is ready to accept input.

If the message **PLEASE WAIT** is in the middle of the status window (bottom of screen), or the database transaction window (a small window indicating databases transaction) is present, the system is busy and will not accept input.

If a Red Box appears to the left of Notification Messages during system processing, there may be a problem with the current data retrieval. The data specification statements or last system request should be re-evaluated.

GARBAGE COLLECTION

Occasionally a **GC** notice appears at the bottom of the screen, and the system appears to stop processing, don't panic. This means *Garbage Collection*, and is a routine internal memory maintenance feature of the system. It is performed automatically whenever the memory area gets cluttered. It will end soon, and system processing will continue.

3.2.4 System Errors

System errors may occur at any of the system operating levels (Solaris/UNIX, LISP, DART program, Oracle, etc). While most recovery steps have been designed into DART, it is occasionally possible for errors to require user intervention.

The user should remember that all TPFDD editing actions are stored and retained from the moment of input; thus, it is rare for any editing operations to be lost due to system errors. The main impact of system errors is the time lost in restarting the system functions.

Any situation editing activity in progress at the time of error may, however, be lost.

FIRST THING TO CHECK

If the system freezes and nothing appears to respond, first check the **CAPS LOCK KEY** of the keyboard. The system will lock up, and fail to respond to mouse clicks, whenever this key is depressed, and there is no obvious warning for this condition. To correct, release the key. This is a traditional problem with UNIX workstations.

BACKGROUND WINDOWS

DART and the DART TPFDD Editor are independent processes that are activated through independent Xterm windows, named **Background Windows**. These windows may aid in troubleshooting. These windows may be opened or iconified without harming the system operation in any way.

These background windows are always present during their respective operations, although they may be iconified. The icons for these windows may be overlayed; if both are not found, move the visible icons around.

DART Background Window

The DART background window appears as an icon at the top of the screen when a DART session is initiated. If an error occurs in the operation of DART, the debugger will be invoked. An error message will be displayed in this window with a menu of options on how to proceed.

TPFDD Editor Background Window

The TPFDD Editor background window appears, momentarily, in the middle of the screen, when a TPFDD Editor session is initiated. It may or may not have been iconified. This window is used similarly to the DART background window.

OTHER ERROR INDICATIONS

If an **ERROR!** message appears in the middle of the status line (along the bottom of the screen), a system error has occurred. Several recovery means may be attempted.

1. A small image of a mushroom is displayed in the upper right corner of the DART main screen, above the Analysis Information Panel. This is the *Error Recovery Mushroom*. Click the mouse on the mushroom. This may recover the current DART session.

2. If it did not open automatically, click on the **DART Background icon** to open and read the DART Background window. (This icon is usually displayed in the upper left corner of the background screen.)

3. If the system does not recover, see the DART System Administrator.

If the background window appears with a message such as:

"**… > > > Error… select 0, 1, etc to return to LISP toplevel…**"

record or copy any pertinent data, for the System Administrator, and attempt to follow the instructions.

1. The error recovery mushroom may be tried here, without any harm.

2. The user can obtain additional information about the error by typing the following commands in the background window:

   :v verbose listing of error
   :d redisplay options available

3. If the window merely states that some function or operation should not be re-attempted, note and report the problem, and work around the error.

4. However, if nothing seems to recover, type **(quit)**, including the parenthesis, to exit from the LISP activity; this will probably also stop DART, or the TPFDD Editor (as applicable), which will have to be restarted.

REFRESH SCREEN

Should some part of the screen/window become confused or unusable, click on the **Refresh Screen** option on the Utilities Menu, or **Refresh Button** on the DART Main Screen (upper left corner -- not available on all DART versions). This will redraw the screen image.

MUSHROOM

The Error Recovery Mushroom is in the upper right corner of the DART main screen, above the Analysis Information Panel. If a system error occurs, click the mouse on the mushroom. This should recover the current DART session.

3.2.5 Files

The following data file types support DART operation:

TPFDD Files

A TPFDD contains detailed movement requirements for an OPLAN. TPFDD files usually originate in the JOPES database and must be downloaded to the DART system as data files, then loaded into the DART (Oracle) database table structure. Alternately, TPFDDs may also be created within the DART database. DART users view and manipulate the TPFDD data while it is resident in the DART database. The DART database may contain several TPFDDs at any one time.

As an intermediate stage, a TPFDD that has been downloaded from JOPES to DART, or uploaded back to JOPES, will be stored in a UNIX file format somewhere in the DART UNIX filesystem. The Oracle database tables are internal to the database storage partitions, and are not visible in the UNIX filesystem.

Situation Files

Situation files contain information pertaining to asset characteristics and allocations, port characteristics, and node assignments. They are stored and retrieved by the name assigned by the DART user.

Situation files may be classed as either public or private. These are stored in different directories on the DART workstation.

Analysis Files

An analysis file contains a roll-up of all data used for, and resulting from, a specific model run. It may contain all, or a portion of, the following: TPFDD summary information, current situation information, and all analysis results information related to that model run.

Analysis files are stored under a user's /dartdata sub-directory. These files occupy a very large amount of space, and old files should be reviewed and deleted whenever possible.

Since the user is allowed to open more than one analysis, DART layers the analyses, and calls these layers **windows.** (This term has nothing to do with the X-Windows terminology.)

Results Files

Each time a RAPIDSIM model run is performed, standard RAPIDSIM results reports (separate from and in addition to the analysis) are saved to a file using the Model Run name. These files should be deleted periodically to avoid wasting disk space. When deleting results files, a window appears, prompting the user to checkmark the files to delete.

The model runs can be given specific names by the user at the time of the run, otherwise the system assigns a default name using 'RS' plus the day and time the model run was performed. These files are stored in the /archive/ directory.

Standard Reference Files

DART uses data obtained from JOPES standard reference files. These reference files are moved from a JOPES/WWMCCS source to DART as data files, stored in the DART UNIX filesystem temporarily, and then converted into an Oracle database table format. Once in the database, GEOFILE, TUCHA, and Unit Information data can be queried directly by the user through the **View** function, in the TPFDD Editor.

If needed, CHSTR and ASSETS files also may be downloaded from JOPES and loaded into the DART database for use in creating Situation files.

3.2.6 Editing

DART stores and uses text and other strings of character data for various functions. The user may have to edit these text entries.

Due to DART design and UNIX system features, the text editing process varies between different functions, and will appear somewhat different from that commonly encountered in personal computer word-processors. Commonly, all necessary editing can be performed using the cursor arrow keys, and the backspace or delete keys. If more complex editing is needed, the following special cursor control keys may be used:

< CONTROL > f	Moves forward a character.
< CONTROL > b	Moves back a character.
< CONTROL > a	Moves to beginning of line.
< CONTROL > e	Moves to end of line.
< CONTROL > d	Deletes the next character after the cursor.
< CONTROL > k	Erases (kill) from cursor position to end of line.
< DELETE >	Deletes a character at a time from right to left.

(These are basically EMACS editor commands.)

EDITABLE STRINGS

When a prompt window instructs the user to type a string of characters, the user should type exactly what is between the quotation marks.

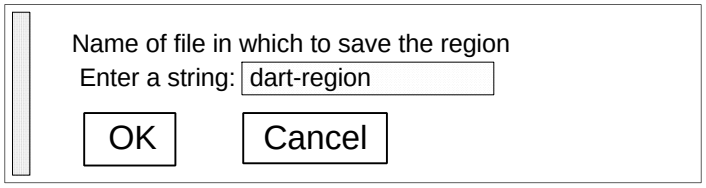


Figure 10-1: Sample Text Edit Box

When the prompt **Enter a String** or **An Editable String** is encountered, the mouse should be clicked on this prompt, and the appropriate string of data/text should be entered. As an example:

When the prompt **Enter a Number** is encountered, click on this prompt, and then enter a number in the appropriate range.

EDIT SITUATION C-DAY

When a string of C-Day associated values, such as utilization rates, requires editing, highlight the string and click the left mouse button. Existing values must be edited using the above cursor controls.

To insert a new C-Day value, type "**Cm:n**" where m is the new day, and n is the associated number

Example: C3:12

Press **< RETURN >** when editing of a string is complete. When all required changes are complete, select OK to continue.

ANNOTATE GRAPH TEXT

Graph text and other graph annotations should be edited using similar techniques.

UNIX EDITORS

The UNIX-based SunOS system provides several text editors that may be used for general purposes. One of these may be set as the DART user default editor. …

Epoch (an X-Windows variation of Gnu EMACS)

Gnu EMACS

The UNIX family of vi, ex, and ed

Xedit (a basic windows editor; DART reports are displayed in Xlook windows, which are modified Xedit windows)

3.3 UTILITY FUNCTIONS

DART provides a variety of system utility functions accessible through various means. These sources are listed here for reference; details about specific functions will be found in other sections.

CAUTION: Some of these features are workstation unique.

3.3.1 Utilities Button on Main Menu Bar

This button displays a pop-up menu containing the following options:

Refresh Screen

This option will repaint the screen. This might be useful if some feature of the screen appears to be frozen or otherwise not behaving properly.

Hardcopy Window…

This option will send an image of the selected window to the specified (or default) printer.

Save Screen to File

Save Window to File

Save Region to File

These options will capture (save) a screen, window, or region image to a .gif file. The user can specify the name of the file. The capture file then can be exported to another system, or retrieved.

Retrieve Window from File

This option will pop-up a menu of available previously saved graphics files, for selection; and then display a window containing that graphic (in **.gif** format). To close this retrieved screen, place the mouse in the middle of the window and type **q** (for quit).

Reload DART Preferences

This option reloads user specific preferences for the current DART session. Default values for tape drive, map region, and enabling/ disabling models can be specified in the preferences file. This feature is only used if the DART preferences file has been changed since DART was started. This is a System Admin function.

Set Printer Options

This option allows the output device (printer) for printing system outputs and reports to be specified. Defaults have Black and White (B&W) printer set to PostScript, and LPtr set to line. This is a System Admin function.

Import RAPIDSIM Setup

This option will import and convert RAPIDSIM setup files from DART Build I into DART Build III situation files.

Self Test

This option brings up a menu with the following options:

- *RAPIDSIM End to End Test*, which runs a **canned** analysis via RAPIDSIM.

- *Command Execution Time Reporting*, a diagnostic routine.

These are System Admin functions.

Show Legal Notice

This option displays (temporarily) the copyright information in the center of the DART Top Level screen.

3.3.2 Background Screen Pop-up Utility Menus (From Sun Workstation, If Configured)

The Background Screen is the area of the monitor screen which is not contained in a window. It may display the local site logo or other graphics.

From the Sun Workstation (Server), some options to perform various utility functions may be accessed from the background screen. Since these options provide powerful system management tools, they should be used with care.

To activate these options, depress one of the mouse buttons (each activates a different menu) while the mouse pointer is positioned on the background screen, and scroll to select an option; and release the button.

LEFT BUTTON

Xterm window

Generates a new Xterm window, which can be used to access the UNIX system.

Emacs window

Generates a new EMACS window, for use as a text editor; for experienced users only. (If accidently activated, escape from EMACS with **< CONTROL > x c**.)

TWM Operations

These are the X11R5 Window Manager operations. This option displays a submenu of operations to be performed in the windowing environment; most of these are not generally needed by the user:

- Hide and Show Icon Manager
- Refresh
- Unfocus

- Cut File
- TWM Version and Source .twmrc
- Restart
- Exit (completely quits from DART and X-Windows, and returns to the basic UNIX system; requires login to restart).

Window Operations

This option displays a submenu of other window operations; these can be useful:

- Refresh
- (de)Iconify
- Move
- Force Move
- Resize
- Raise/Lower
- Focus on Window
- Kill (window only).

MIDDLE BUTTON

DART

Initiates a DART session manually (ensure DART session is not already operating, iconified, before using this option).

GTN

Ignore this option (for USTRANSCOM development only).

Hardcopy Region (B&W)

Sends a black and white picture of the selected region to the laser printer.

Hardcopy Region (reverse)

Sends a black and white reversed-image picture of the selected region to the laser printer.

Hardcopy Window (color)

Sends a color picture of the selected window to the color printer; this option fails with the laser printer.

Hardcopy Window (B&W)

Sends a black and white picture of the selected window to the laser printer.

Hardcopy Window (reverse)

Sends a black and white reversed-image picture of the selected window to the laser printer.

Macify Window (color)

Captures a color picture of the selected window to a **.gif** file.

Macify Window (MacPaint)

Captures a black and white picture of the selected window to a **MacPaint** file.

RIGHT BUTTON

The right mouse button activates a menu which contains three screen lock options. Each activates a different screen saver pattern which will run until the user presses **< RETURN >** and then enters their password, which deactivates the screen lock.

CAUTION: This feature should be used carefully, since it effectively locks up the workstation until released by the original operator. Do not use these screen lock options while logged in to the system with a password that no one else knows.

3.4 PRINTING AND GRAPHICS OUTPUT

The DART system provides a number of functions for producing output in various forms. This section describes ways to print reports and graphics, and to capture and view graphical images. When operating in the GCCS environment, follow procedures identified for printing in that environment. Procedures for printing from this environment were under development at the time of this publication. The following procedures have worked in the stand-alone environment and may be useful to some users.

3.4.1 Printer Configurations

On the DART system, **printing** means producing hardcopy paper output from one of the connected printers.

On most DART systems, the printer defaults are preset. These may be changed through the **Set Printer Options** feature (see below).

Three printing options, however, may be encountered in various DART setup menus:

- Color
- B&W (black and white)
- Reverse (inverse of black and white).

The B&W and Reverse options apply to the postscript printer, and refer to that printer's graphics printing capability.

SET PRINTER OPTIONS

This option, available under the Main Menu Utility button, allows output devices (printers) for printing system outputs and reports to be specified.

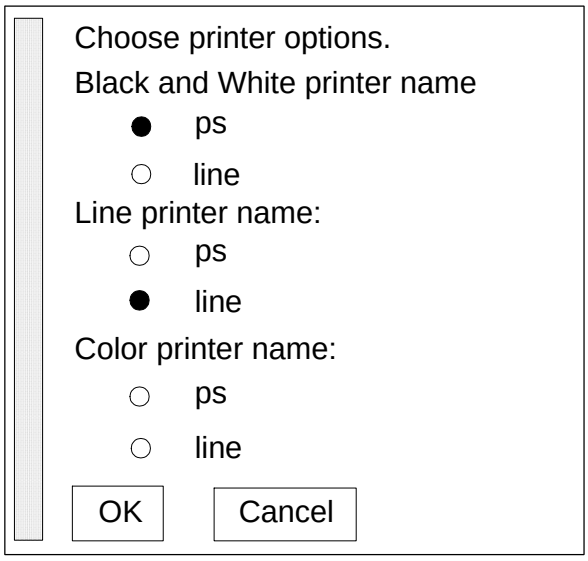


Figure 11-1: Printer Options Menu

The standard settings are:

- Black and White set to **ps** (Postscript).
- Line Printer set to **line**.

3.4.2 Printing F11 Reports

The line printer is most commonly used for printing the F11 reports. The line printer is established as the default printer for those reports.

Once the desired F11 report is selected, DART automatically creates a report output file that is sent to the printer. No further selection is needed to address the line printer.

The file is temporarily stored, and may be retrieved for further user processing, until the next report file is generated. (The section on landscape printing, below, shows possible file locations.)

It is possible to output F11 reports in landscape, on letter-sized paper, using the postscript printer, using manual UNIX system commands.

3.4.3 DART Graphics Capabilities

Graphics means a copy of some image displayed on the workstation monitor.

DART provides functions to:

- **Capture** a graphical image as a file, for later display or transfer to a different workstation.
- Produce a printed **hardcopy** image on a laser printer.

DART supports the capture or hardcopy printing of:

- Complete **windows** (areas within designated borders).
- Any user-outlined rectangular **region** on the screen.

SELECT WINDOW OR REGION

Both hardcopy printing and image capture require the user to designate the window or region whose image is desired. The process is as follows:

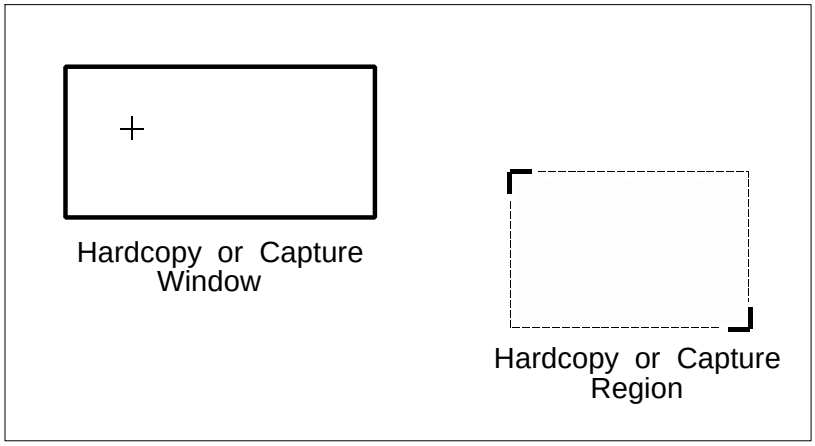


Figure 12-1: Window or Region Selection

1. Select the desired menu option (hardcopy or capture; window or region).

2. Move the mouse pointer to the desired area;

   And, if selecting a window:

3. The mouse pointer symbol will become a cross.

4. Move the cross to the window to be printed, and click the left button. Do not move the mouse until two quick beeps are sounded.

   Or, if selecting a region:

3. The mouse pointer will change to a corner angle.

4. Position this corner angle at the upper left corner of the desired region.

5. Depress and hold down the left mouse button; move the cursor, which has become another angle, to the lower right corner of the desired area. Release the button. No beeps will be heard.

There is no way to stop or abort the selection process after a menu option has been selected. If trapped in an unwanted operation, the best route is usually to attempt to capture or print as small an area as possible (to minimize wasted time).

Several seconds will elapse between the time the menu selection is made, and the appearance of the new mouse pointer shape. At the instant the new mouse pointer appears, the full screen will be frozen with the colors displayed at that time. The selected image will also display those colors.

To ensure use of proper colors, the user should therefore move the mouse pointer back into the area of the desired image during the time delay, in order to secure the most legible image.

3.4.4 Printing Hardcopy Graphics

The graphics printing functions, in slightly different combinations, are available from two utility sources:

DART Main Menu Utilities Button

This provides one printing option:

Hardcopy Window…

This option will send a copy of the image in the selected window to the attached laser printer.

This option will first activate a window allowing the user to specify printing parameters and the type of printer to direct the output. These should not be changed unless necessary. (The default is for B&W, and Postscript printer.)

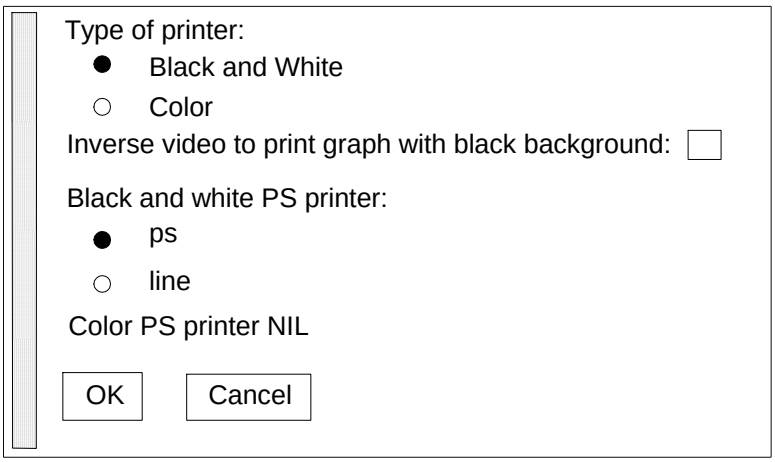


Figure 13-1: Hardcopy Printer Setup

Background Screen Pop-up Utility Menu (Sun Workstation only, if configured)

This menu becomes accessible by pressing the **middle mouse button** while the mouse pointer is positioned over the Background Screen. This menu displays five printing options:

Hardcopy Region (B&W)

Hardcopy Region (reverse)
Hardcopy Window (color)
Hardcopy Window (B&W)
Hardcopy Window (reverse)

If the Color option is selected, with no color printer attached, this option will not function; an error shows in the Console window. (This error does not affect other operations.)

Comparing the two sets of options, the Background Screen selections provide more possibilities, and are usually the best ones to select.

PRINTING PROCESS

To perform any of the B&W or Reverse Hardcopy functions:

1. Select the desired menu option.

2. Move the mouse pointer (cross or corner angle) to the desired area, and select the desired window or region to be printed.

CAUTION: The reverse mode of printing screen graphics has some undependable ramifications at this time. Some experimentation may be needed.

3.4.5 Graphics Captures and Macify

Macify originally meant to perform a screen capture on the contents of the desired window or region for subsequent transfer and display or printing on a Macintosh or other personal computer (PC). Now, the term simply means a **graphics capture to file** process. (This differs from **hardcopy**, which sends the image directly to the printer.)

DART provides two forms of graphics capture:

Color This format stores a full color image of the designated region or window in a **.gif** format. This is a format widely used on Macintosh and other PCs. This form of macify will completely capture any of the DART windows, or any region on the screen.

The captured **.gif** file may be retrieved for display, or may be transferred to another system for use.

Black and White

This format stores a B&W image of the designated region or window in a MacPaint (Macintosh COTS software) format. This format has limited size capabilities and will not completely store the larger DART windows.

Screens may be captured using either the **Background Screen Utility** menu or the **Main Menu Utilities Button**. Both methods can produce **.gif** files, but only the Background Screen utility can produce MacPaint-compatible files.

FILE NAMING CONVENTIONS

Two graphics file naming conventions may be encountered in DART:

1. When a capture option is selected using the **Main Menu Utilities Button**, the user is prompted for a filename. Any name may be used. A descriptive name, however, makes using these files easier.

   If files are to be exported to some application, the file names should be appropriate to that application. Files in the **.gif** format, which are expected to be used in a PC-based application, should end with **.gif**.

2. When a capture option is selected using the **Background Screen Pop-Up**, default file names are assigned by DART.

   The **.gif** files are given file names of **gifnnnn**, and MacPaint files are given names of **macpnnnn**, where nnnn is a sequential number.

   The specific name assigned to any specific screen capture can be ascertained by checking the Console system window (usually hidden behind the top of the main DART screen). The file name and destination of each screen capture are displayed in the Console window. For example:

   Destination = /home/ < username > /dartdata/screens/gif2986

   The file name can also be determined by recording the time of each capture, and then later examining the date-time stamp on the files which have the appropriate naming convention.

Captured files are usually stored in the

/home/ < username > /dartdata/screens directory.

GRAPHICS CAPTURE PROCESS

Using the **Main Menu Utilities Button**:

1. Select an option from one of:
   Save Screen to File
   Save Window to File
   Save Region to File

2. A window will appear asking for a file name. Type in the desired name.

3. Select the desired window or region.

4. Each of these options will perform a Macify … (color) screen capture, saving the graphic in a **.gif** file format.

Using the **Background Screen Pop-Up Utilities Menu**:

1. With the mouse pointer positioned over any section of the Background Screen, hold down the middle mouse button; a menu will appear.

2. Select either of:
   Macify Window (color) for a **.gif** screen capture.
   Macify Window (MacPaint) for a black and white screen capture.

3. Then, for either set of options, select the desired window or region.

4. The selected area will be captured to a file.

3.4.6 View Graphics Files

The **.gif** files produced using the capture procedures can be recalled and viewed on the DART workstation screen.

To view a saved graphics file:

1. Choose the **Retrieve Window from File** option from the **Main Menu Utilities Button**.

2. This option will pop-up a menu of available previously saved graphics files for selection. Select the desired file.

3. The selected (**.gif** format) file will be displayed in an **xgif** window.

   Be aware when using this option that this is just a picture of a screen, and none of the options portrayed are mouse-sensitive.

4. To close this retrieved image window, place the mouse in the middle of the window and type **q** (for quit).

3.4.7 Advanced System Printing Functions

The printing methods described above are those which are most easily accessible. The DART workstation, through the UNIX system, provides a number of other and more powerful and complex methods of formatting and printing. These require some degree of experience and UNIX system knowledge by the user. Several examples are described here, for the adventurous.

All of these commands must be given from within an **Xterm** window, and from the appropriate place within the UNIX file structure. The precise details depend on the local system and network configuration, and type of workstation used.

PRINT UNIX TEXT FILES

The standard DART postscript laser printer is addressed via the system (UNIX) command and name:

lpr -Pps

(The **lpr** command actually sends a file to the print spooler, while the **-Pps** option selects the postscript printer.)

Any ASCII text file piped to that command will usually be printed on the laser printer. For example, the command:

more < filename > | lpr -Pps

will print the named file. (The **more** command, which often has an alias of **m**, merely displays a document one page at a time; the **cat** command might also be used here. The | character is the pipe, sending the pages one by one to the **lpr** command.)

PRINT LANDSCAPE F11 REPORTS

To print an F11 report sideways (landscape) on the laser printer use this command (from an Xterm window):

pl -Pps < filename > :postprint -pl

The **pl** command is located in the directory **/export/newsprint/bin** (which may have to be attached as a catfile string).

The appropriate report filename must be used for these commands. As soon as they are created for the screen display, F11 report text files are placed, temporarily, in one of several system locations:

- In the **/home/<username>/dartdata/runlog** directory, as filenames **F11D.out** or **F1E.out**, for reports produced by the top-level reports icon

- In other locations, as stated on the top border of the xlook display window, for reports prepared from the TPFDD Editor functions. These files may exist only for as long as the xlook window exists.

In either case, the appropriate filename should be used.

3.5 GCCS TPFDD AND REFERENCE FILE TRANSFERS

When operating DART in the GCCS environment the user should refer to GCCS documentation for procedures to transfer TPFDDs and reference files into DART. Refer to the "Revised TIP End Users Manual", 6 January 1994 or updated versions, for specific guidance. Presently, this is accomplished using the Information Management Subsystem (IMS) for TPFDD transfers and Reference File Manager (RFM) for reference files between WWMCCS and the GCCS client/server environment. Since the GCCS platform is under development and revision at the time of this publication, to include documentation, see your GCCS System Administrator for the most recent guidance.